REMARKS/ARGUMENTS

Favorable reconsideration of this application is respectfully requested in view of the above amendments and the following remarks.

Claims 52-76 remain pending in this application. By this amendment, Claim 72 has been amended. Claims 52-55, 59-71 and 74-76 stand withdrawn from consideration as directed to one or more non-elected inventions.

Withdrawn Claim 59 depends from independent Claim 56, and withdrawn Claim 74 depends from independent Claim 72. It is respectfully requested that upon allowance of either Claim 56 or Claim 72 that Claim 59 or Claim 74 be rejoined under the procedure of MPEP § 821.04.

In the outstanding Office Action, Claims 72 and 73 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite; Claims 56-58 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Schell et al. (U.S. 5,952,110, hereinafter "Schell") in view of Koizumi et al. (EP 1035231 A1, hereinafter "Koizumi"); and Claims 72 and 73 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Schell in view of Koizumi and further in view of Kamo et al. (U.S. 4,738,227, hereinafter "Kamo") and Church et al. (U.S. 3,956,531, hereinafter "Church").

Responsive to the rejection of Claims 72 and 73 under 35 U.S.C. § 112, second paragraph, as being indefinite,"the intermediate substance" has been deleted from Claim 72. Accordingly, it is respectfully requested that this rejection be reconsidered and withdrawn.

Schell describes "[a]n abrasive coating suitable for forming an abrasive blade tip of a gas turbine engine."[1] Schell states that "[p]referred materials for the abrasive particles 14 [sic – 16] are microcrystalline oxides."[2] Those particles are "incorporated into the alloy and

[1] Abstract.
[2] Column 5, lines 26-27.

ceramic layers 12 and 14 to abrade a ceramic shroud."[3] Schell indicates that the abrasive blade tip coating is formed by:

> 1. depositing an initial layer of the NiCrCoAl alloy;[4]
>
> 2. incorporating the abrasive particles 16 into the alloy layer 12 until a single layer of particles 16 is deposited;[5] and
>
> 3. depositing ceramic layer 14 by known plasma spraying or PVD techniques.[6]

Schell indicates that the preferred technique for depositing alloy layer 12 "is to electrodeposit the NiCrCoAl alloy, such as by use of the electroplating method disclosed in U.S. Pat. No. 4,789,411."[7] Furthermore, Schell indicates that "the abrasive particles 16 are preferably incorporated into the alloy layer 12 until a single layer of particles 16 is deposited as shown in FIG. 1."[8]

The rejection reasoning fails to meet the "as a whole" requirement because the absence of detailed teachings is disregarded. For example, the limitation "*processing the portion as a workpiece of an electric spark machine and a tool electrode...*" to form coatings as commonly recited in independent Claims 56 and 72 is neither taught nor suggest by Schell or the other cited references. An electric spark machine is a well-known machine specialized for electric spark machining. Please see the following explanations made in "The McGraw-Hill Dictionary of Scientific and Technical Terms 5th edition":

> electric spark machining [MET] A process by which materials that conduct electricity can be removed from a metal by an electric spark; used to form holes of varied shapes in materials of poor machinability.

Although conventional electric spark machining uses electric spark for removing a surface part of the workpiece, in Claims 56 and 72 the subject electric spark is used to

[3] Column 5, lines 30-33. See also FIG. 1.
[4] Column 5, lines 36-37.
[5] Column 5, lines 37-40.
[6] Column 5, lines 47-48.
[7] Column 5, lines 42-45.
[8] Column 5, lines 38-40.

remove and throw a tip of an electrode toward a workpiece to form coatings thereon. The aforementioned limitation requires use of this method and therefore clearly differentiates the claimed subject from the references.

In contrast, Schell fails to describe use of an electric spark machine.

Instead Schell describes electroplating and further describes plasma spraying or PVD (physical vapor deposition) techniques[9] for formation of coatings. As to the plasma spraying, please see the following explanation in "McGraw-Hill". Apparently these methods must not use an electric spark machine. Therefore Schell fails to teach the aforementioned limitation.

McGraw-Hill states:

> plasma spraying [MET] In thermal sparing, melting and transference of a metal coating to a workpiece by use of a nontransferred arc.
>
> surface allowing [MET] Deposition and metallurgical bonding of additional metals or alloys on the surface of ferrous or nonferrous metals; such additional materials become an integral part of the total mass, as distinguished from coatings which are bonded mechanically.

Similar observations apply to the other references. For example, Koizumi describes electrospark allowing (ESA) for depositing coatings.[10] One skilled in the art field of electric spark machining would not be taught as to what constitutes the ESA, because Koizumi fails to describe details thereof and further these art fields are not nonanalogous and are out of Applicants field of endeavor. However, it appears that the ESA is a kind of surface alloying as listed in "McGraw-Hill" and uses a machine as that used for arc welding. More specifically, this method must not use an electric spark machine and therefore Koizumi fails to teach the aforementioned limitation.

No teaching, suggestion, motivation or other logical reason to change a deposition method of Schell or Koizumi into a method carried out by an electric spark machine can be

[9] See column 5, lines 47-48.
[10] See paragraph [0002].

found in the cited references. Therefore the claimed subject is submitted to be unobvious over the cited references.

Further in regard to Claim 72, the references fail to teach or suggest "closing pores of the protective coating by filling a powder of SiO_2 or $MoSi_2$ into the pores and heating the portion enough to change the powered into amorphous SiO_2".

The Office Action asserts that Kamo teaches a similar step. However Kamo teaches zirconia plasma spraying as the Office Action recognizes.

No motivation or suggestion to substitute "filling a powder of SiO_2 or $MoSi_2$ into the pores" for the zirconia plasma spraing can be found because one skilled in the art would know that "filling" is too rough to make a through covering and therefore expect insufficiency or poor closure unless plasma spraying is used. Contrary to such an expectation, amorphous $Si0_2$ changed from SiO_2 or $MoSi_2$ provides sufficient pore closure because of its moderate fluidity at high temperatures. The combination of porous protective coating and "filling a powder of SiO_2 or $MoSi_2$ into the pores" provides such an unexpected result.

It is respectfully submitted that dependent Claims 57, 58 and 73 are patentable at least for the reasons argued above with regard to Claims 56 and 72 from which they depend.

Accordingly, it is respectfully requested that the rejections of Claims 56-58, 72 and 73 be reconsidered and withdrawn, and that Claims 56-59 and 72-74 be passed to allowance.

Consequently, for the reasons discussed in detail above, no further issues are believed to be outstanding in the present application and the present application is believed to be in condition for formal allowance. Therefore, a Notice of Allowance is earnestly solicited.

Should the Examiner deem that any further action is necessary to place this application in even better form for allowance, the Examiner is encouraged to contact the undersigned representative at the below-listed telephone number.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
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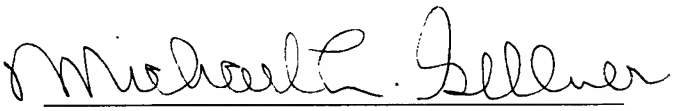

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